IN THE CLAIMS

Please amend the claims as follows:

1. (original) Ultrasonic image processing system, for processing images in an image sequence representing a segment of artery explored along its longitudinal axis, said artery segment showing moving walls; this system comprising:

semi-automatic detection means for detecting the artery walls in an image of the sequence;

automatic rigid tracking means for tracking the corresponding artery walls in other images of the sequence;

evaluation means for evaluating the artery wall motion and distensibility; and

viewing means for visualizing images.

2. (original) The system of Claim 1, wherein the semi-automatic detection means is a user assisted artery wall detection means comprising user interaction means for:

selecting a reference image as starting image among the images of the sequence;

drawing lines, called paths, representing the artery walls in the starting image, assisted by a path search technique based on the minimization of a cost function.

3. (original) The system of Claim 2, wherein the user interaction means for drawing a path representing a wall comprises means for:

selecting a starting pixel in the starting image for creating a new path structure;

drawing a portion of path between the starting pixel and a second selected pixel in the starting image;

evaluating the cost function of the portion of path as the sum of the cost of the individual pixels that constitute the path;

selecting the optimal path as the path that minimizes the cost function;

memorizing the optimal path;

drawing portions of path between successive pixels; and performing the operations of evaluating the respective cost functions, selecting the optimal paths and memorizing the optimal paths until a complete path is drawn for the artery wall.

4. (original) The system of Claim 3, having means for estimating the cost of the individual pixels based on the gradient at the pixel in the ultrasonic image.

5. (currently amended) The system of one of ~~Claims 3 or 4~~<u>claim 3</u>, wherein the automatic rigid tracking means for tracking the

corresponding artery walls in other images of the sequence comprises means of path finding including means for:

defining regions of interest (ROIP, ROID) around the paths drawn in the starting image and using the same regions of interest in the other images of the sequence;

selecting a current image next to the starting image;

initializing the tracking of the paths in the current image by using the positions of the paths in the starting image;

applying translations to said initial paths in the current image to fit the walls in the current image;

evaluating the cost of the paths in the current image using the same **cost function** as in the starting image and finding the translations that minimizes the cost function;

iterating these path finding steps until the beginning and the end of the sequence are reached.

6. (original) The system of Claim 5, wherein means for evaluating the cost performs cost evaluation of the individual pixels based on the gradient at the pixel in the ultrasonic images calculated for all the images of the sequence, considered as a two-dimensional plus time volume.

7. (currently amended) The system of ~~one of Claims 1 to 6~~claim 1,

comprising computation means for calculating the dilation of the artery along the ultrasound beams in the images of the sequence using the segmentation of the walls performed by path finding with semi-automatic detection and rigid tracking.

8. (original) The system of Claim 7, comprising computation means for calculating the distensibility as the ratio of the dilation by the diameter of the artery.

9. (currently amended) A system as claimed in ~~one of Claims 1 to 8~~claim 1, having color display means to display colored paths for the artery walls and colored patterns for the wall dilation, superimposed on the ultrasonic images.

10. (currently amended) A system as claimed in ~~one of Claims 1 to 9~~claim 1, comprising a suitably programmed computer of a workstation or a special purpose processor having circuit means, which are arranged to process ultrasonic images, having means to display the processed images, and having a user interface such as a mouse or a keyboard to permit the user of interacting on the respective images of the sequence in order to display the quantified parameters related to the artery walls.

11. (currently amended) A computer program product comprising a set of instructions to be used in a system as claimed in ~~one of Claims 1 to 9~~claim 1.

12. (currently amended) A system as claimed in ~~one of Claims 1 to 11~~claim 1, wherein the transducer array is a curved transducer array.

13. (original) An ultrasonic medical image processing method comprising steps of acquiring a sequence of ultrasound images, using an array of transducer elements, and steps for detecting anomalies in arteries comprising:

semi-automatic detection of the artery walls in a reference image of the sequence;

automatic rigid tracking of the corresponding artery walls in other images of the sequence; evaluation of the artery wall motion and distensibility; and

visualization of images.

14. (currently amended) An ultrasound examination apparatus having means to acquired ultrasound images and coupled to an image processing system according to ~~one of Claims 1 to 12~~claim 1.